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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/517,705	12/13/2004	Hirofumi Masuda	1600-0157PUS1	9097

2292 7590 11/28/2006

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EXAMINER
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BERNSHTEYN, MICHAEL

ART UNIT	PAPER NUMBER
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1713

DATE MAILED: 11/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/517,705

Applicant(s)

MASUDA ET AL.

Examiner

Michael Bernshteyn

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 18 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,3 and 5-22 is/are pending in the application.
- 4a) Of the above claim(s) 10-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3 and 5-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1,3 and 5-22 are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 18, 2006 has been entered.
2. This Office Action follows a response filed on April 27, 2006. Claims 1 and 3 have been amended; claims 2 and 4 have been cancelled. Claims 10-22 have been withdrawn from the further consideration by the examiner, 37 CFR 1.142 (b), as being drawn to non-elected invention.
3. Applicant's arguments, see remarks, filed on October 18, 2006, with respect to the rejection(s) of claim(s) 1-9 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Nakagawa et al. (JP 02-269709).
4. Claims 1, 3 and 5-9 are active.

### ***Claim Rejections - 35 USC § 103***

5. The test of this section of Title 35 U.S.C. not included in this action can be found in a prior Office Action.

6. Claims 1, 3 and 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable as obvious over Moriyama et al. (U.S. Patent Application Publication 2001/0005742) in view of Nakagawa et al. (JP 02-269709).

With regard to the limitation of instant claims 1, 3, 5, 7 and 8, Moriyama discloses a butenedioic acid monoalkyl-copolymerized acrylic elastomer containing 0.1-30% by mole of butenedioic acid monoalkyl ester on the basis of carboxyl groups copolymerized in the acrylic elastomer or its cross-linkable composition (abstract). Butenedioic acid monoalkyl-copolymerized acrylic elastomer includes, for example, copolymers of at least one of alkyl acrylate and alkoxyalkyl acrylate with monoalkyl ester of butanedioic acid such as maleic acid, fumaric acid, etc. Alkyl acrylate includes, for example alkyl acrylates with alkyl groups having 1-8 carbon atoms, such as methyl acrylate, ethyl acrylate, etc. Alkoxyalkyl acrylate includes, for example alkoxyalkyl acrylates with alkoxyalkyl groups of 2-8 carbon atoms, such as methoxymethyl acrylate, 2-methoxyethyl acrylate, etc. (page 1, [0010], [0011]).

Moriyama discloses that butenedioic acid monoalkyl ester-copolymerized acrylic elastomer can be further copolymerized, within such a range as not to deteriorate the characteristics (e.g. not more than about 30% by weight) with other vinyl or olefinic monomers, such as styrene, **cyclohexyl acrylate**, etc. (page 1, [0012]).

Moriyama discloses that content of butenedioic acid monoalkyl ester in the acrylic elastomer must be 0.1-30% by mole, preferably 0.5-20% by mole, more preferably 1-15% by mole, on the basis of the copolymerized carboxyl groups in the acrylic elastomer (page 2, [0018]). Alkyl acrylates are preferable from the viewpoint of

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balance between oil resistance and low temperature resistance. Generally, the longer the chain of alkyl group, the more effective the low temperature resistance, the less effective the oil resistance, and vice versa. The alkoxyalkyl acrylates have an ether group as a side chain and thus are distinguished in balance between low temperature resistance and oil resistance (page 1, [0010, [0011]).

Moriyama does not disclose the acrylic rubber wherein the units (A) of a monomer selected from the group consisting of monocyclohexyl fumarate and monocyclohexyl maleate.

Nakagawa discloses vinyl chloride copolymer, which is produced by copolymerization of 99-1 wt.% vinyl chloride monomer (A) with 1-99 wt.% **cycloalkyl fumarate** (B), e.g. **monocyclohexyl fumarate** or dicyclohexyl fumarate. The obtained copolymer has a good balance between thermal property and mechanical property, is remarkably improved in heat resistance, impact resistance and moldability as compared with a conventional vinyl chloride resin, and is useful for piping materials, valves, automobile members, pipes, film, sheets, weak-current machine members, etc., which have problematic in heat resistance, impact resistance and moldability (abstract).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate monocyclohexyl fumarate as taught Nakagawa in the adjusted amount into Moriyama's acrylic rubber in order to improve heat resistance, impact resistance and moldability (JP'709, abstract), and thus to arrive the subject matter of claim 1 and dependable claims 3 and 5-9.

With regard to the limitation of instant claim 6, Moriyama discloses that an amount of carboxyl groups in the copolymer can be determined by subjecting thoroughly water-washed, reprecipitated, water-washed and dried copolymer to neutralization titration to obtain an acid value, followed by calculation [0020]. Acid value of washed copolymer is 4.5-5.1 mg/g, which is within the claimed range (table 1, [0047]).

With regard to the limitation of instant claim 7, Moriyama discloses the copolymers of at least one of alkyl acrylate and alkoxyalkyl acrylate with a monoalkyl ester of butenedioic acid such as maleic acid, fumaric acid, etc., for example, monoesters of methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl, octyl, 2-ethylhexyl, nonyl, decyl, undecyl, dodecyl, etc. (page 1, [0009]).

With regard to the limitation of instant claim 9, Moriyama discloses that the resulting acrylic elastomer has a Mooney viscosity  $ML_{1+4}$  (100°C) of about 10 to about 100, preferably about **20 to about 80**, which is within the claimed range [0017].

Thus, the combination of Moriyama and Nakagawa renders claims 1, 3 and 5-9 *prima facie* obvious in view of absent of unexpected results commensurate in scope of claims.

### **Conclusion**

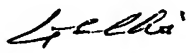
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Bernshteyn whose telephone number is 571-272-2411. The examiner can normally be reached on M-F 8-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on 571-272-1114. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Michael Bernshteyn  
Examiner  
Art Unit 1713

MB  
11/20/2006

  
LING-SUI CHOI  
PRIMARY EXAMINER